VIDAR NDT*PRO*
Industrial Film Digitizer

User Guide
For Use with Windows XP & Windows 7

(Serial Numbers 370,000 to 379,999)

VIDAR systems corporation
A 3D Systems Company

P/N 19441-001, Rev A

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Caution: No operator-serviceable parts inside. Refer servicing to qualified personnel.
Achtung: Gehäuse nicht öffnen. Wartung uno reparatur nur durch eletrofachkräfte.
Attention: Aucune piece ne peut etre remplacee par l'utilisateur. Toute operation de maintenance doit etre effectuee par une personne qualiee.
Atencion: Acceso interno solo autorizado a personal tecnico cualificado.
Attenzione: Non appire. Rivolgersi a personale qualificado.

Radio Frequency Emissions

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area can cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Product compliance testing was conducted using VIDAR shielded cables. Modifications to the digitizer or the VIDAR shielded cables or the use of cables other than those available from VIDAR could void the user's authority to operate the equipment.

Acceptable shipping conditions

- Temperature: –18° to +60°C (0° to +140°F)
- Relative humidity: 20% to 85%, non-condensing
- Atmospheric pressure: 500 to 1060hPa (+18,000 to –1,200ft)

Operating conditions

- Temperature: 10°C to 30°C (60°F to 85°F)
- Relative humidity: 20% to 85%, non-condensing
- Atmospheric pressure: 696 to 1013hPa (10,000 to 0 ft)

Electrical supply

- Voltage: 100 to 240 VAC
- Current: 0.75 to 1.5 A
- Frequency: 47 to 63 Hz

Safety and compliance information

MEDICAL EQUIPMENT WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL60601-1, IEC60601-1 AND CAN/CSA C22.2 No. 601.1

5RA9

This product is intended to be turned on and left on. Operation is continuous. To maintain Medical Equipment Certification, the digitizer must be connected to a host computer that has been configured in accordance with IEC 60601-1-1.

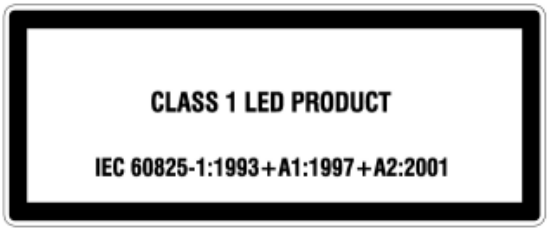
This product is in the Ordinary Equipment Class. It provides no protection against the ingress of water.

This product is not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or with nitrous oxide.

Class I Medical Device; No Applied Parts. This product provides Class I medical device protection against electrical shock.

Power cords used with this device in North America must be rated by Underwriters Laboratories for hospital use. Power cords used with this device in Europe must meet the requirements of IEC 227 Designation 53 or IEC 245 Designation 53.

Correct and safe operation of the digitizer requires familiarity with information that is not marked on the product. The following symbol indicates the operator should consult the manual for additional information.



This Class 1 LED device is safe under reasonably foreseeable conditions of operation.

The LED illumination system consists of 16 Class 1 LEDs, a mirror system to spread the light, and a diffuser to distribute the light approximately uniformly across an area of 2.4 sq in (15.5 sq cm). Light from the LED illuminator may be indirectly observed in the digitizer's film entry and exit areas.

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Intended Use

The NDT*PRO* Industrial Film Digitizer is intended for making digital copies of x-ray films for non-destructive testing applications. This device is not intended for medical use.

About Digitizer and Film Sizes

Nominal resolution	Pixels (14”x17” film)	Spot size (µm)	DPI	Line pairs per mm
2K x 2.5K	2100 x 2550	170	150	3
4K x 5K	4200 x 5100	85	300	6
8K x 10K	7980 x 9690	44	570	11

Scan modes 16-bit, 12-bit and 8-bit grayscale outputs

Manual Feed

Film sizes

Width: 2.36" to 14" (6cm to 35.6cm)
Length: 8" to 51"† (20.3cm to 129.5cm)
Thickness: 0.006" to 0.010" (0.15mm to 0.51mm)

†Longer films over 17” require user support during feeding, and a scanning application that handles long films.

Auto film feeder Standard 25-film capacity (mixed sizes, no presorting)

Film sizes “Light box loading”: head-up, normal reading, left justified

Width: 7” to 14” (20.3cm x 35.6cm)
Length 8” to 17” (20.3cm x 43.2cm)
Thickness: 0.006” to 0.010” (0.15mm to 0.51mm)

About Films

The film digitizer handles standard radiograph film sizes up to 14” (35.5cm) wide.

You can batch feed multiple films (up to 25), and you can mix film sizes ranging from 8” x 8” (20.3cm x 24.5cm) to 14” x 17” (35.5cm x 43cm) in one batch feed stack—as long as you follow the rules below.

> **IMPORTANT:** Remove stickers, tape, staples, paper clips, etc. from films before scanning. These may cause serious film feeding problems and may damage the digitizer’s internal mechanisms. **Failure to remove extraneous items from films will void your warranty.**

Load films just as you would view them on a light box, with these qualifications:

- Films must be loaded left justified.
- Do not load films more than 17” (43.2cm) long for batch scanning in the auto feeder. See “Digitizing a single film,” later in this chapter, when loading films longer than 17”.

Basic Operating Instructions

1. Turn on the film digitizer and wait for all three LEDs to turn green.

   Note: Always turn on the film digitizer before turning on the computer. This enables the computer to recognize the digitizer.

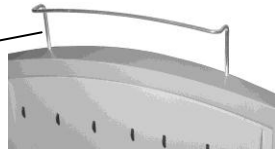
   Note: Several minutes are required for the digitizer to carry out its internal diagnostics and establish communications with the scanning application. These activities must be completed before you can load film into the digitizer.

2. Turn on the computer.

3. Launch the scanning application.

   IMPORTANT: Remove stickers, tape, staples, paper clips, etc. from films before scanning. These may cause serious film feeding problems. Failure to remove extraneous items from films will void your warranty.

4. If you will be digitizing films 17" (43.2cm) or longer, raise the film support bar.

   - Longer films out to 51" may require manual support.

5. Load the film.

   How you load the film depends on whether you are digitizing one film or multiple films, and the film sizes to be digitized. See the next pages for details.

   CAUTION: X-ray images displayed on a computer monitor are representative only. A variety of factors influence image density and size—including monitor luminance and calibration, window and level settings, zoom level, and dimensional and grayscale inaccuracies resulting from build-up of tolerances in the digitizer, display board and computer. For this reason, special precautions must be exercised (e.g., calibrating the software ruler and computer monitor) when taking measurements from digitized images. Please refer to the user's manual for your digitizing software for more information.

   Note: All films, regardless of size, must be left justified when loaded into the feeder and/or digitizer.

Digitizing a Single Film

Options for digitizing single films

There are two ways to scan a single film:

- By manually inserting the film behind the blue bar (as described in this section), or
- By treating the single film as a batch-of-one (if the scanning application supports this approach); for instructions, see "Digitizing multiple films" (next section in this manual).

The digitizer *cannot batch-of-one feed* a single film smaller than 8" wide x 8" long (20.3cm wide x 20.3cm long). **Do not scan paper.**

1. Hold the film in front of you as you would view it on a light box.

2. Align the **left edge** of the film with the film guide on the **left side** of the feeder.

3. Place the film into the slot **BEHIND the blue bar**.

   The blue bar has a lip and a groove on the top edge of the digitizer where the feeder is attached. Place a single film directly behind the blue bar.

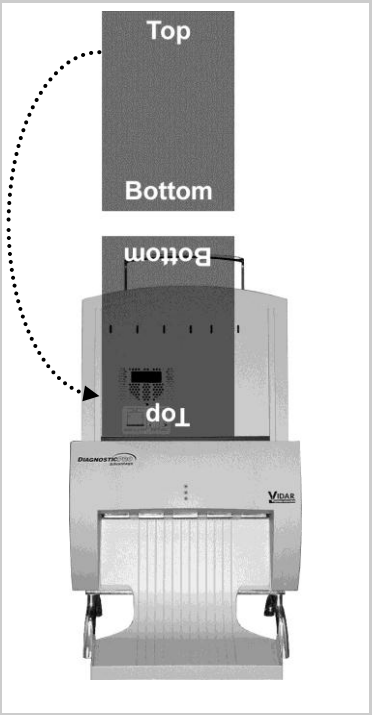
When the digitizer senses the film, it automatically stages the film in preparation for digitizing. The film will first move down, then up. This is normal operation.

CAUTION: If the film is not staged properly, do not manually pull the film out of the digitizer. Instead, use the scanning application's EJECT command to remove the film.

Note: When a film has been staged, it is in the digitizer's light path. The ADC (Automatic Digitizer Calibration) feature requires that the light path be clear of the film for proper background calibration of the digitizer. The digitizer will automatically adjust the film's position to properly proceed with ADC. Depending on the location of the film's leading or trailing edge, and the length of time the film has been blocking the light path, the film will be: a) pushed up, or b) pushed down.

4. Using your scanning software, execute the **Scan** command.

Note: Proper orientation of the film during loading depends on the scanning application program you are using. Some scanning programs rotate images 180° for display. If images appear upside down, you may be able to set the default orientation in the scanning application. If this option isn't available, then insert films into the digitizer upside down, as shown here.



Digitizing Multiple Films

CAUTION: Do not load more than 25 films at one time.

1. Hold the film stack in front of you as you would view it on a light box.

   Films at the back of the stack are digitized first.

Note: The digitizer cannot *batch feed* films smaller than 8" wide x 8" long (20.3cm wide x 20.3cm long). When loading small films, the vertical dimension *must* be at least 8" (20.3cm). Do not scan paper.

2. Align the left edge of the film stack with the film guide on the left edge of the feeder.

3. Place the film stack **IN the groove in the blue bar**.

   The blue bar has a lip and a groove on the top edge of the digitizer where the feeder is attached.

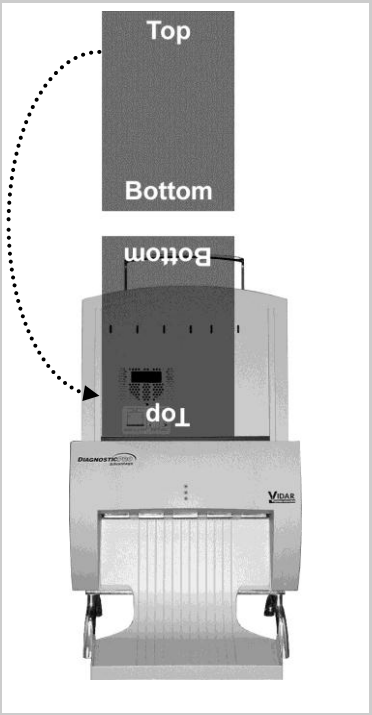
Note: If you are digitizing a single film, place the film directly **BEHIND the blue bar**. (This film must be at least 8" wide x 8" long (20.3cm wide x 20.3cm long).

Note: When a film has been staged, it is in the digitizer's light path. The ADC (Automatic Digitizer Calibration) feature requires that the light path be clear of the film for proper background calibration of the digitizer. The digitizer will automatically adjust the film's position to properly proceed with ADC. Depending on the location of the film's leading or trailing edge, and the length of time the film has been blocking the light path, the film will be: a) pushed up, or b) pushed down.

4. Using your scanning software, execute the **Scan** command.

Note: During extended batch scans (more than 5 films), the digitizer may pause periodically to recalibrate. This is normal operation.

Note: Proper orientation of the film during loading depends on the scanning application program you are using. Some scanning programs rotate images 180° for display. If images appear upside down, you may be able to set the default orientation in the scanning application. If this option isn't available, then insert films into the digitizer upside down, as shown here.

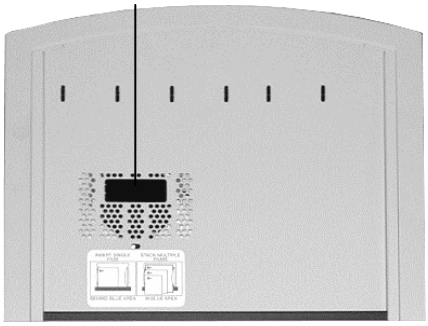


Preventive Maintenance

Cleaning the Auto-Feed Roller

After extensive use, dust or lint particles may build up on the Auto-Feed Roller. VIDAR recommends cleaning the roller at least twice per year.

Auto-Feed Roller



Loop a piece of light adhesive tape (such as Scotch® Magic™ Tape) around your fingers with the adhesive side out, then gently pat the roller. Pat and turn the roller until its entire surface is clean.

CAUTION:

- **Do not** use any type of cleaning solvent on the feed roller and idler wheels, as this could damage these components and cause improper operation.
- **Do not** use tape with a strong adhesive, such as packing tape or strapping tape.
- **Do not** use tape requiring the adhesive to be wetted, such as brown paper packing tape.

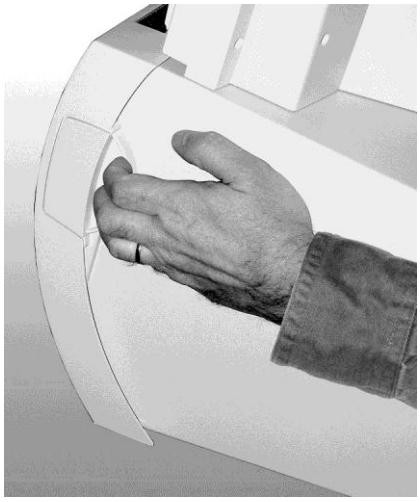
Cleaning the Diffuser

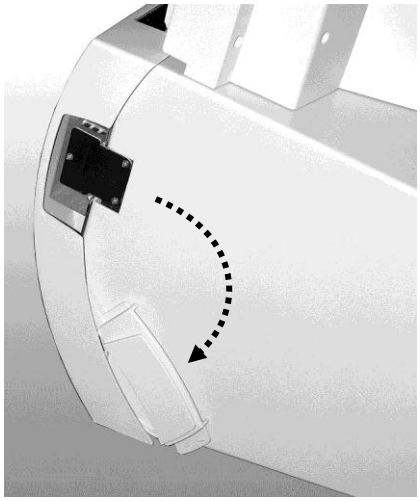
If you notice streaks (vertical artifacts) in images, you should clean the diffuser.

1. Turn off the digitizer. **Allow 10 to 15 minutes for the bulb cartridge to cool to a comfortable temperature before removing it.**

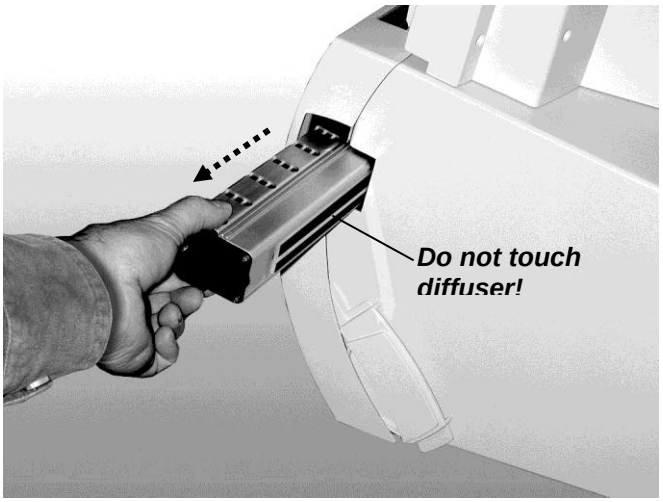
2. Open the door on the side of the digitizer base:

3. Remove the lamp Cartridge Clamp using a #2 Philips screwdriver.





4. Grasp the top and bottom of the lamp cartridge, and then pull it out.

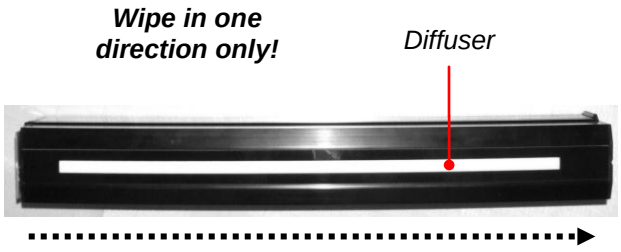


CAUTION: Do not touch the diffuser material with your fingers.

5. Place the lamp cartridge on a flat surface with the diffuser facing up.

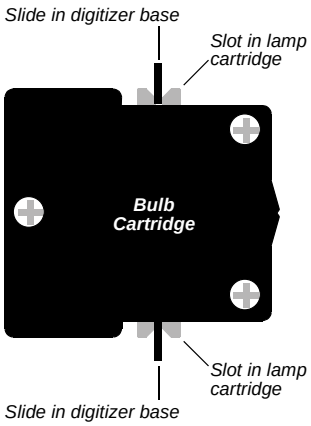
6. Clean the diffuser using a lint-free wipe (VIDAR P/N: 15194 or P/N: 4247). **Wipe in one direction only. Don't wipe back and forth.**

Note: The lamp cartridge assembly will resemble the image shown below:

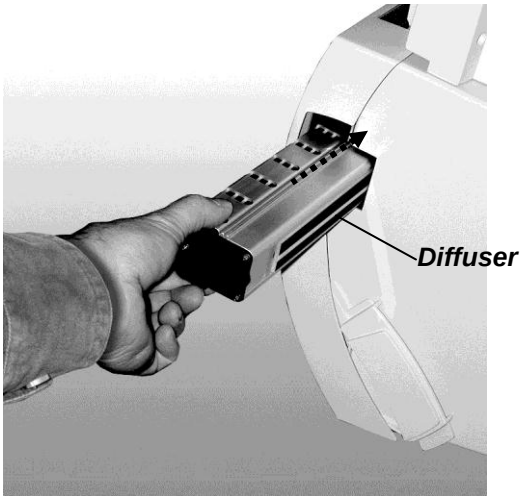


IMPORTANT: DO NOT USE ALCOHOL or other SOLVENTS as they may degrade the diffuser and void your warranty.

7. Insert the lamp cartridge into the digitizer base:



   - The diffuser must face the rear of the digitizer base.
   - The end of the lamp cartridge with the white connector goes in first.
   - Ensure the slots along the top and bottom of the cartridge align with the slides in the digitizer (see illustration at right).
   - When the cartridge is nearly all the way in, push it firmly until you feel the connector snap into place.

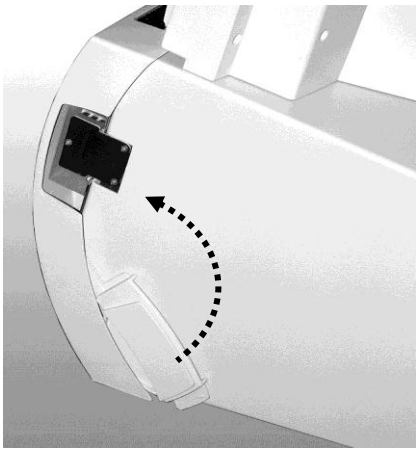


Slide cartridge in...

then push to seat connector

8. Re-install the lamp cartridge clamp assembly if removed earlier.

9. Close the door on the side of the digitizer base. Be sure the door closes fully.



10. Turn on the digitizer. The digitizer will recalibrate to the cleaned diffuser.

Replacing the Lamp Cartridge

WARNING: The lamp cartridge assembly is specific to the **NDT*PRO* Industrial Film Digitizer** model. Ensure you have the correct replacement lamp Cartridge before installing a new lamp.

Contact VIDAR Technical Support if you have any questions about installing or using your VIDAR film digitizer:

Phone: +1.800.471.SCAN (+1.800.471.7226)
+1.703.471.7070 outside the U.S.

E-mail: mailto:medtech@vidar.com

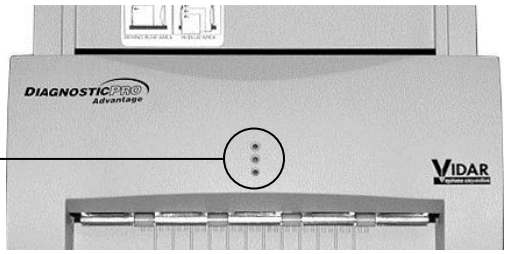
Follow the instructions in "Cleaning the Diffuser," earlier in this chapter, but work with the new lamp cartridge in steps 5 through 10.

Preventive maintenance is not covered under warranty. (Only failures during the published warranty period are covered by warranty replacement. Failures must be confirmed by running VIDAR's Digitizer Diagnostic Tool. The software generates a report showing light values indicative of lamp performance. You can request a copy of the Digitizer Diagnostic program from VIDAR Technical Support.)

Troubleshooting

Reading the LEDs

Three LEDs on the front of the digitizer provide operating information.



LEDs

	Location	Function	Normal state
	Top LED	Feeder status	Solid green
	Center LED	Digitizer status	Solid green, but slow flashing when digitizer is busy
	Bottom LED	Power status	Solid green

Tables on the next three pages explain all LED states.

Top LED: feeder status

LED state	Digitizer condition	Corrective action
Solid green	Ready	None. The feeder is ready to operate.
Off	ERROR: no feeder attached	1. Turn off digitizer. 2. Remove feeder. 3. Inspect electrical connector and screws on bottom of feeder.
Fast flashing green	ERROR: unknown feeder attached	Check feeder: 1. Turn off digitizer. 2. Remove feeder. 3. Inspect electrical connector and screws on bottom of feeder.
Slow flashing green	BUSY: film is staging	None. This is normal operation.
Fast flashing green	ERROR: film staging problem	Eject film by clicking the eject button in the scanning application.

Center LED: Digitizer Status

LED state	Digitizer condition	Corrective action
Solid green	Ready	None. The digitizer is ready to accept commands from the scanning application.
Slow flashing green	BUSY: normalizing	None. This is normal operation. The LED will flash slowly during initial calibration after power is applied, and when the scanning application initiates a calibration.
Slow flashing green	BUSY: tracking (ADC)	None. This is normal operation. The LED will flash periodically when the digitizer is idle. Automatic Digitizer Calibration (ADC) is independent of the scanning application.
Slow flashing green	BUSY: staging film	None. This is normal operation. The LED will flash slowly while the digitizer is staging the film.
Slow flashing green	BUSY: Positioning film	None. This is normal operation. The LED will flash slowly while the scanning application is positioning the film.
Slow flashing green	BUSY: digitizing film	None. This is normal operation. The LED will flash slowly while a film is being digitized.
Slow flashing green	BUSY: ejecting film	None. This is normal operation. The LED will flash slowly while the scanning application is ejecting the film.
Off	ERROR	1. Make certain power is supplied to the digitizer, and that the digitizer power switch is on. 2. If problem persists, get qualified technical help (see “In case of difficulty,” later in this chapter).

Bottom LED: Power Status

LED state	Digitizer condition	Corrective action
Solid green	Ready	None.
Fast flashing green	ERROR: DSP not communicating	Get qualified technical help (see “In case of difficulty,” later in this chapter).
Fast flashing green	ERROR: unknown ballast	Get qualified technical help (see “In case of difficulty,” later in this chapter).
Off	ERROR	1. Make certain power is supplied to the digitizer, and that the digitizer power switch is on. 2. If problem persists, get qualified technical help (see “In case of difficulty,” later in this chapter).

In Case of Difficulty

How to use this section:

1. Look through the left columns to find a description of the problem you are having.
2. Follow the instructions (in order) in the “Corrective action” column. If the one corrective action doesn’t solve the problem, then carry out the next corrective action.
3. When the instruction is “Get qualified technical help,” then:
   a. Contact your system integration specialist (the company or person that installed your VIDAR film digitizer).
   b. If your system integration specialist isn’t available, then contact VIDAR Customer Support (medtech@VIDAR.com). Please record system information and digitizer serial number before calling, and have it available when calling.

Tip: Check www.filmdigitizer.com for current troubleshooting information, tools and software updates.

Symptom	Corrective action
Can’t turn digitizer on or off. Can’t find power switch.	The on/off switch is located on the rear of the digitizer body. Look at the digitizer from the rear to see the switch.
Streaks in image	Clean lamp diffuser (see “Cleaning the diffuser” in the “Cleaning and maintaining” chapter, earlier in this manual).
Bottom LED (power status) is off.	Ensure wall outlet is providing AC power: obtain another electrical device known to be working, and plug it into that AC wall outlet. ■ If other device doesn’t work, AC power is not available at that wall outlet. Get help from building services. ■ If other device does work, AC power is available from that outlet.

Symptom	Corrective action
Film starts and stops during scanning.	1. Increase memory allocation for scanning software. (Especially if scanning at high resolutions, memory allocation must be sufficient to accept data stream from digitizer.) 2. If scanning to disk, ensure sufficient space is available on disk drive. 3. Ensure PC has enough memory available to support scanning application. Close applications not needed for image acquisition from digitizer. 4. If problem persists, get qualified technical help.
Digitizer stops scanning and PC locks up.	1. Reset entire system: a. Turn digitizer off. b. Shut down PC. c. Turn digitizer on. d. After digitizer all three digitizer LEDs turn solid green, turn on PC. 2. Launch scanning software on PC, then try scanning again. If problem persists, get qualified technical help. 3. Check for correct device driver installation.
Digitizer was working properly, but after installing (or reinstalling) the scanning application there are Toolkit errors or the digitizer is not detected.	1. If you installed a new scanning application, or if you reinstalled the existing application. Install the VIDAR Drivers from the Installation CD (see appropriate section in the “Installing device drivers” chapter). 2. If problem persists, contact medtech@VIDAR.com.
Digitizer is not listed in Windows™ Control Panel under Scanners and Cameras.	1. Update VIDAR drivers. See “Computers with Windows™ XP and Windows™ 7” in the “Installing device drivers” chapter. 2. Check all cables and connectors.
Digitizer is not detected.	1. Check all cables and connectors. 2. Reset entire system: a. Turn digitizer off. b. Shut down PC. c. Turn digitizer on. d. After digitizer all three digitizer LEDs turn solid green, turn on PC.
Auto Feeder does not reliably feed films.	1. Clean the lift roller on the Feeder.

Symptom	Corrective action
Computer does not recognize the digitizer when it is connected through a USB cable.	VIDAR firmware does not support USB 1.1. The digitizer may not be detected by the host computer if it is connected to a USB 1.1 port. The digitizer must be connected to a USB 2.0 port. ■ Check the operating system to ensure the latest service pack is installed (Windows™ XP must have Service Pack 3, Windows™ 7 must have Service Pack 1 or higher). Microsoft does not support USB 2.0 in older service packs. ■ If the computer does not have a USB 2.0 port, install a USB 2.0 adapter. .
Windows XP does not recognize the USB-connected film digitizer when another USB scanner is connected to the system.	Disconnect the other scanner from the system. Windows XP (SP1 and SP2) supports only one scanner per system.

Note: The use of portable or mobile communications equipment and/or the presence of strong electromagnetic and/or x-ray fields may interfere with proper operation of this product. This product should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, verify normal operation in the configuration in which it will be used. Should such interference occur, the user is required to provide adequate isolation between the digitizer and the source of the interference. Isolation is typically achieved by moving the digitizer away from the source of the interference.

Weights and Dimensions

Shipping weight and dimensions

Shipping dimensions	24" wide x 29" deep x 24" high 610mm x 737mm x 610mm
Shipping weight	60 lb 27 kg

Digitizer weight and dimensions:

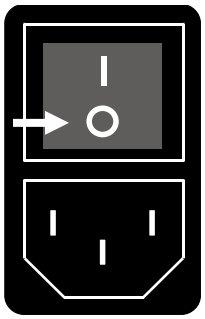
Overall dimensions	19" wide x 23" deep x 29.25" high 483mm x 584mm x 743mm
Footprint	19" wide x 23" deep 483mm x 584mm
Weight	45 lb 21 kg

Packing the Film Digitizer for Shipment

IMPORTANT: When shipping the film digitizer, you **must** use the original packing materials, including wire ties, plastic bags, plastic wrap, foam supports and cartons. Improper packaging may allow damage to the digitizer, which will incur additional charges for repair.

1. Turn Off the Digitizer

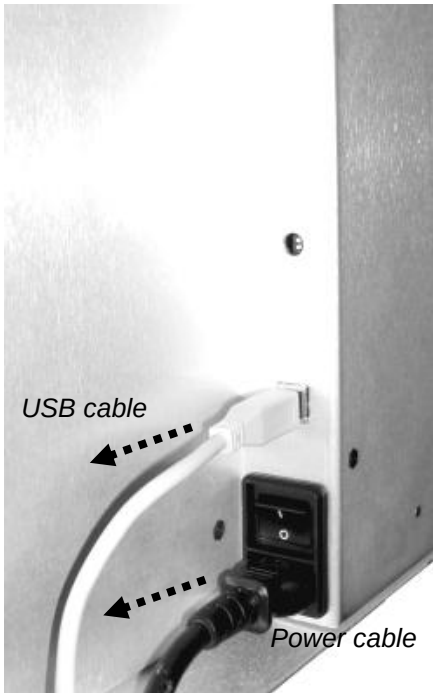
Press “0” on the power switch.



2. Disconnect the Power Cord and USB Cable

a. Disconnect the power cord from the Power Entry Module on the rear of the digitizer.

b. Disconnect the USB cable from the rear of the digitizer.



3. Remove the Exit Tray from the Digitizer Base

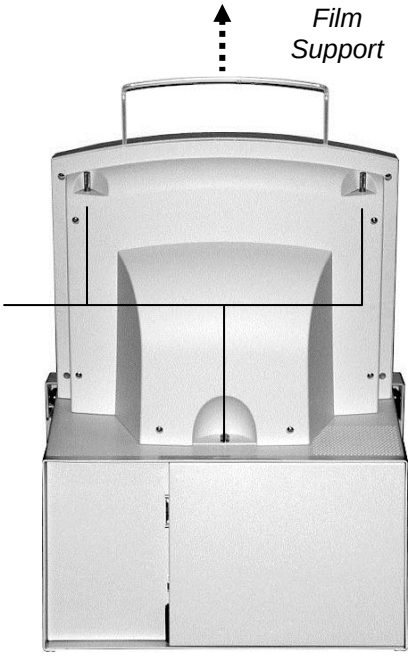
Lift the exit tray up to disengage it from the plastic edge just below the rollers, and then pull it gently toward you.

4. Remove the Feeder from the Digitizer Base

a. Remove the film support bar from the top of the feeder

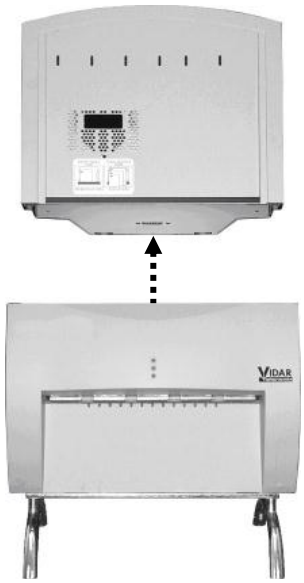
b.

> **Note:** You must remove the film support before packing the feeder; otherwise the feeder will not fit into the foam support



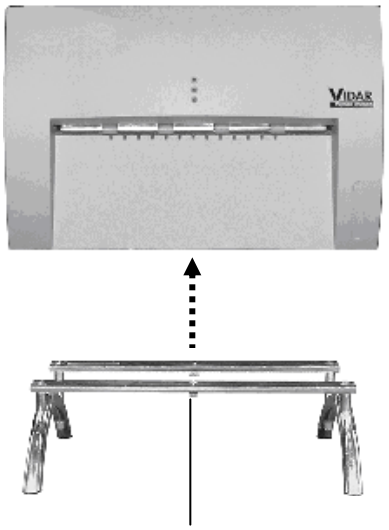
b. Loosen the three thumbscrews securing the feeder to the digitizer base.

c. Lift the feeder up and off the digitizer base.



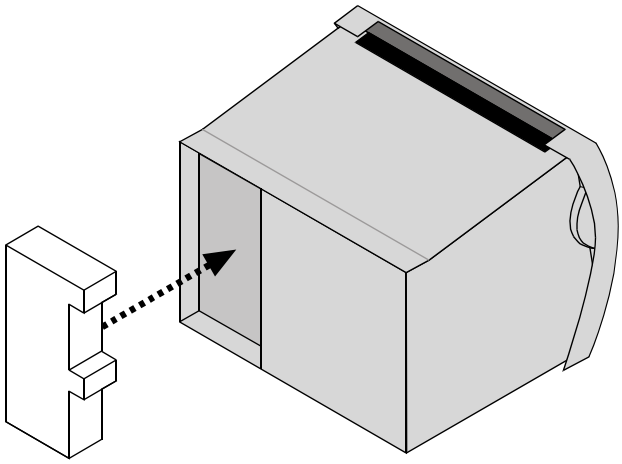
5. Remove the Digitizer Base from the Stand

Loosen the thumbscrews on the bottom of the stand, then lift the digitizer base from the stand.



6. Wrap Certain Items

a. Insert the foam block in the rear of the digitizer base.



b. Place the digitizer base in a plastic bag. Seal the bag with tape.

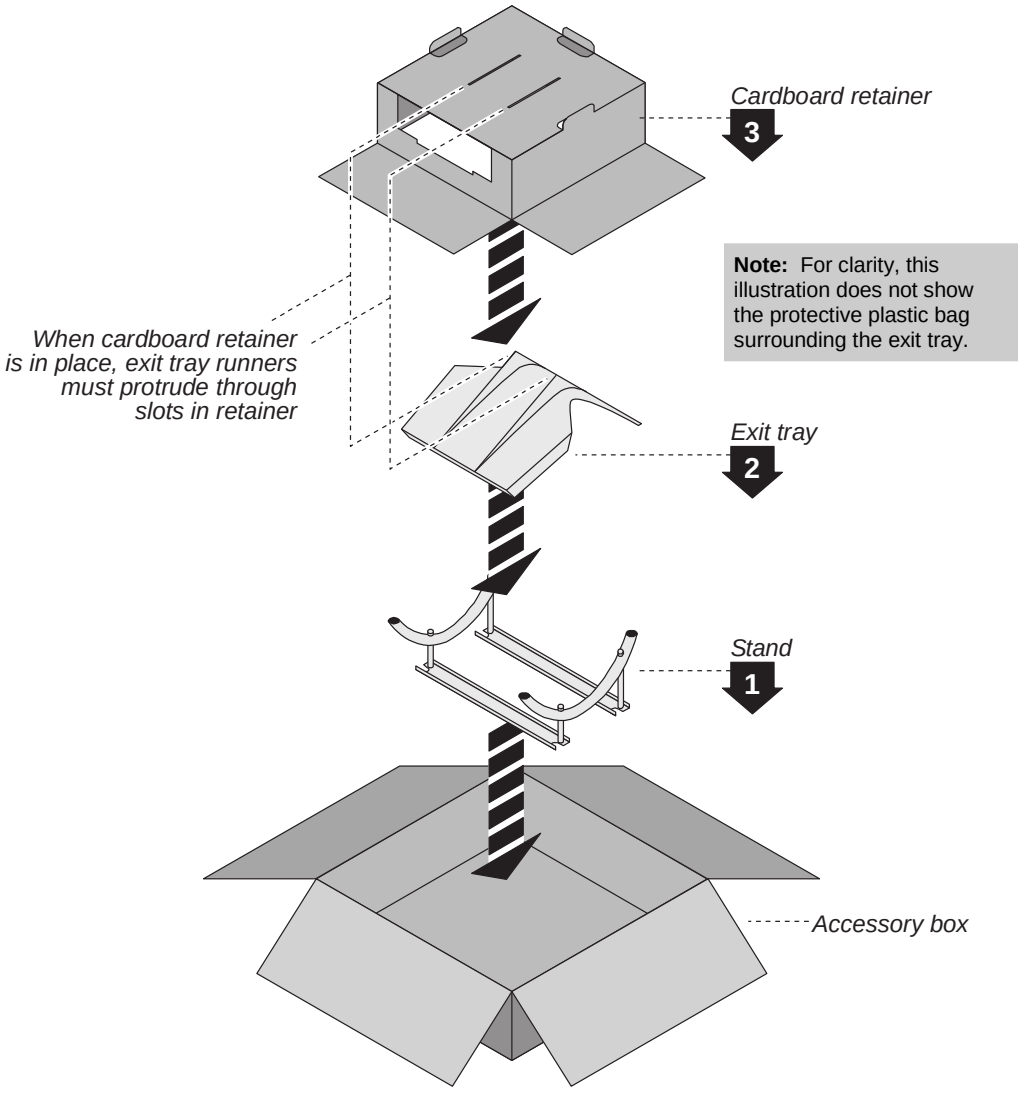
c. Place the film feeder in a plastic bag. Seal the bag with tape.

d. Place the exit tray in a plastic bag. Seal the bag with tape.

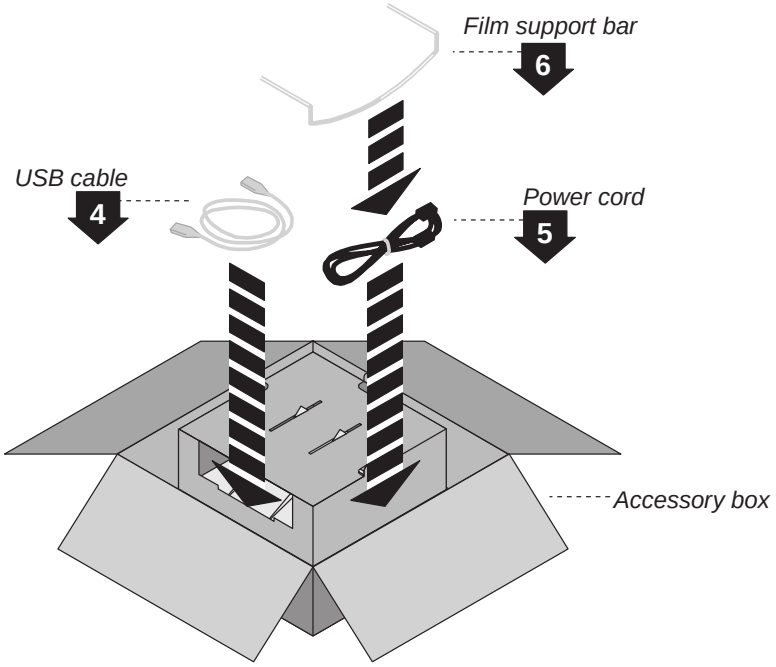
e. Place the film support bar in a padded bag. Seal the bag with tape.

7. Pack the Accessory Box

a. Place these items in the accessory box in the order shown here. Orient the items as shown. When the cardboard retainer is in place, the two runners on the exit tray should protrude through the two slots in the retainer.


Cardboard retainer
3
Note: For clarity, this illustration does not show the protective plastic bag surrounding the exit tray.
When cardboard retainer is in place, exit tray runners must protrude through slots in retainer
Exit tray
2
Stand
1
Accessory box

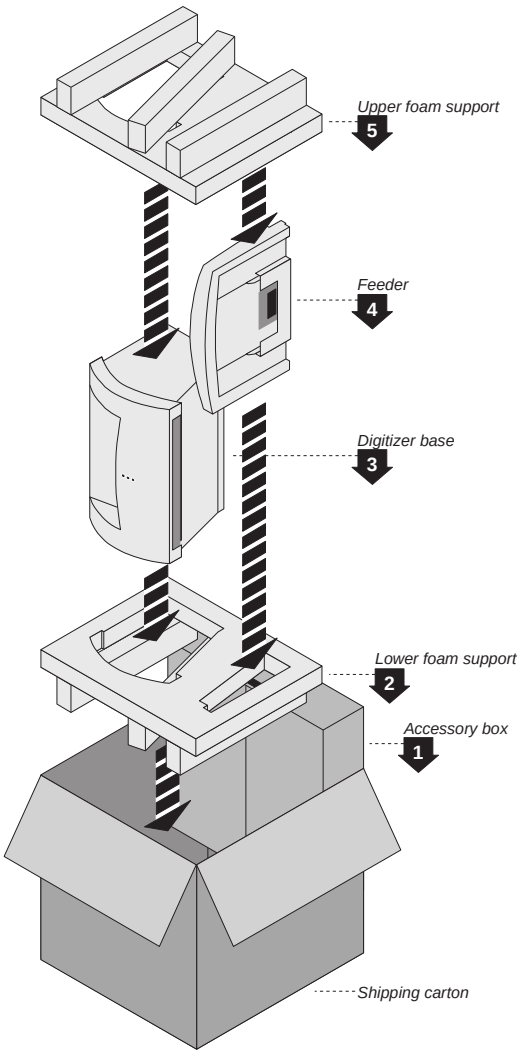
b. Place cables on the cardboard retainer:



c. Close the accessory box and seal it with tape.

8. Pack the Shipping Carton

a. Place the items shown in the shipping carton, as shown here. Orient the items as shown.



Note: For clarity, this illustration does not show the plastic bags surrounding the digitizer and feeder.

b. Close the shipping carton and seal it with tape.

Note: If you are shipping the digitizer to VIDAR for repair or any other reason:

1. Obtain a Returned Materials Authorization (RMA) number by sending an e-mail request to medtech@VIDAR.com. Include the digitizer's serial number and the reason for return.
2. Write the RMA number on the box or shipping label. If the shipment does not have an RMA, processing will be delayed when it reaches VIDAR.

Appendix:
Electromagnetic Guidance

Caution: Medical electrical equipment. **EMC (Electro Magnetic Compatibility) must be considered before any medical electrical equipment is installed or put into service. Follow the information in the accompanying documentation when installing and operating the VIDAR Digitizer.**
Caution: Portable or mobile RF communication equipment can effect Medical Electrical equipment.
Caution: Using the Digitizer adjacent to or stacked with other equipment may cause interference between the equipment. Before utilizing stacked or adjacent equipment, verify proper functionality of all equipment in the actual configuration in which it will operate.
Caution: Connecting the Digitizer to equipment that is not rated CISPR 11 class A or class B may alter the electromagnetic characteristics.
Caution: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Guidance and manufacturer's declaration – electromagnetic equipment

Table 201

The VIDAR NDT*PRO* Industrial Film Digitizer is intended for use in the electromagnetic environment specified below. The customer or end user of the Digitizer should assure that it is used in such an environment.

Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF Emissions CISPR11	Group 1	The Digitizers use RF energy only for their internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions, CISPR11	Class A	The Digitizers are suitable for use in all establishments other than domestic and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance And Manufacturer's Declaration – Electromagnetic Immunity

Table 202

The VIDAR NDT*PRO* Industrial Film Digitizer is intended for use in the electromagnetic environment specified below. The customer or end user of the Digitizer should assure that it is used in such an environment.

Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
ElectroStatic Discharge (ESD) IEC 61000-4-2	+ 6 kV contact + 8 kV air	+ 6 kV contact + 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/ burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % UT (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	<5 % UT (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Digitizer requires continued operation during power mains interruptions, it is recommended that the Digitizer be powered from an uninterruptible power supply or a battery
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE: U_T is the A.C. mains voltage prior to application of the test level

Guidance And Manufacturer's Declaration – Electromagnetic Immunity

Table 204

The VIDAR NDT*PRO* Industrial Film Digitizer is intended for use in the electromagnetic environment specified below. The customer or end user of the Digitizer should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communication equipment should be used no closer to any part of the Digitizer, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	$d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:

Note 1: At 80MHz and 800MHz, the higher frequency range applies.
Note 2: These guidelines may not be applicable in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Digitizer is used exceeds the applicable RF compliance level above, the Digitizer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Digitizer.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended Separation Distances Between Portable And Mobile RF Communications Equipment And The Digitizer

Table 206

The VIDAR NDT*PRO* Industrial Film Digitizer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Digitizer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Digitizer as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter, m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Appendix:
Symbols

Symbol	Description
	Caution – See instructions for use
	Underwriters Laboratories listing symbol
	Compliance to EU Directives
	Authorized Representative in the European Community
	This symbol on the product indicates that this product must not be disposed of as unsorted municipal waste. Instead it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. For more information about where you can dispose of your waste equipment for recycling please contact your local city office, your household waste disposal service or the shop where you purchased the product.

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